

REMARKS

Reconsideration is requested in view of the above amendments and the following remarks. The specification has been editorially revised. Claim 16 has been revised; support for the revision can be found at page 10, lines 11-13 of the present specification. New claims 17-28 have been added. Claims 6 and 7 have been canceled without prejudice. Claims 16-28 are pending in the application.

Editorial revisions have been made to the specification. The resonator length at page 18, lines 22-25 has been changed to 800 μm to 1200 μm, rather than originally disclosed 800 nm to 1200 nm in view of the preceding paragraph (see page 18, lines 4-18 of the present specification). Similarly the length of the first region at page 18, lines 22-25 has been changed to about 400 μm to 600 μm, rather than 400 nm to 600 nm.

New claim 17 tracks original claims 2, 4 and 5 and further includes the feature disclosed at page 10, lines 5-7 of the present specification. New claim 18 is supported by page 9, lines 34-36 and page 18, lines 19-21 of the present specification. New claim 19 is supported by page 18, lines 19-25 of the present specification. New claim 20 is supported by page 18, lines 16-18 of the present specification. New claim 21 tracks original claims 2, 4 and 7 and further includes the feature disclosed at page 10, lines 5-7 of the present specification. New claim 22 tracks original claim 3. New claim 23 tracks original claim 6.

New claim 24 tracks original claim 10 and further includes the feature of the present claim 16. New claim 25 tracks original claim 11. New claim 26 tracks original claim 12. New claim 27 tracks original claim 13. New claim 28 tracks original claim 14.

Claim Rejections – 35 USC § 102

Claims 6, 7 and 16 are rejected under 35 USC § 102(b) as being anticipated by Shimoyama et al. (JP 2000-312052). Applicant respectfully traverses this rejection. Claims 6 and 7 have been canceled without prejudice, rendering the rejection moot as to these two claims. Applicant is not conceding the correctness of the rejection.

Claim 16 is directed to a semiconductor laser device having a ridge including a first region where a width of a bottom portion of the ridge is substantially constant along

an optical path direction, and a second region where the width of the bottom portion of the ridge is varied continuously in the optical path direction. Claim 16 also requires the second region to be placed between the first region and an end face in an optical path. Claim 16 further requires a length of the first region to be 10% to 50% with respect to a resonator length.

With the length of the first region of at most 50% of the resonator length, a differential resistance (R_s) of current-voltage characteristics of the semiconductor laser device can be suppressed and as a result an operation voltage can be decreased. The decrease in the operation voltage permits a lower operation power, which improves the temperature characteristics and reliability of the semiconductor laser device consequently. Moreover, since the length of the first region is at most 50% of the resonator length, the second region can be sufficiently long. As a result, the tilt angle in the second region as shown in Fig. 2 can be reduced, and thus the waveguide loss decreases (see generally page 7, line 36 to page 10, line 31 of the present specification).

Shimoyama et al. fail to disclose a second region where the width of a bottom portion of a ridge is varied continuously in an optical path direction and the second region being placed between a first region and an end face in an optical path, as required by claim 16. Nor do Shimoyama et al. disclose a length of the first region being 10% to 50% with respect to a resonator length, as required by claim 16. In fact, Shimoyama et al. discuss a ridge including five portions: 1) the central portion that having a constant width, which has a length of 400 μm or 300 μm ; 2) two middle portions extending from each end of the central portion and having a continuously changing width, each of which has a length of 30 μm ; and 3) two end portions extending from the outer end of each middle portions and having a constant width, each of which has a length of 20 μm (see Shimoyama et al., paragraphs [0055] and [0063] and Fig. 3(a)). When the length of the central portion of Shimoyama et al. is 400 μm or 300 μm as discussed in paragraphs [0055] and [0063] of Shimoyama et al., the entire resonator length is about 500 μm or 400 μm . Thus, the Shimoyama et al. central portion is 75% or more of the resonator length. Consequently, a differential resistance (R_s) of current-voltage characteristics of the semiconductor laser device is increased and an operation voltage is increased. The

increase in the operation voltage requires a higher operation power. As a result, the amount of heat generated in the semiconductor laser device increases and thereby causes the problem of a reliability degradation of the semiconductor laser device.

Moreover, since the length of Shimoyama et al. central portion is at least 75% of the resonator length, the length of the Shimoyama et al. middle portion of cannot be sufficiently long. As a result, the tilt angle of these middle portions has to be relatively larger, and therefore a waveguide loss increases. Therefore, Shimoyama et al. do not disclose or even suggest a length of the first region being 10% to 50% with respect to a resonator length, as required by claim 16.

For at least these reasons, claim 16 is patentable over Shimoyama et al. Applicant is not conceding the relevance of the rejection to the remaining features of claim 16.

New claim 24 is patentable over Shimoyama et al. for reasons similar to those discussed above. Claim 24 is directed to an optical pickup apparatus that has a semiconductor laser device having a ridge including a first region where a width of a bottom portion of the ridge is substantially constant along an optical path direction, and a second region where the width of the bottom portion of the ridge is varied continuously in the optical path direction. Claim 24 also requires the second region being placed between the first region and an end face in an optical path. Claim 24 further requires a length of the first region to be 10% to 50% with respect to a resonator length. Shimoyama et al. fail to disclose or suggest such an arrangement as recited in claim 24. For at least these reasons, claim 24 is patentable over Shimoyama et al.

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Title: SEMICONDUCTOR LASER DEVICE AND OPTICAL PICK UP APPARATUS USING THE SAME

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In view of the above, favorable reconsideration in the form of a notice of allowance is respectfully requested. Any questions regarding this communication can be directed to the undersigned attorney, Douglas P. Mueller, Reg. No. 30,300, at (612) 455-3804.

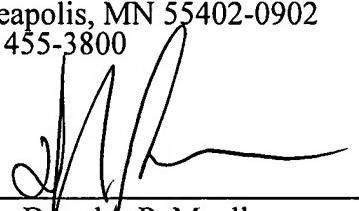


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Respectfully submitted,

HAMRE, SCHUMANN, MUELLER &
LARSON, P.C.
P.O. Box 2902-0902
Minneapolis, MN 55402-0902
(612) 455-3800

By: 

Douglas P. Mueller
Reg. No. 30,300